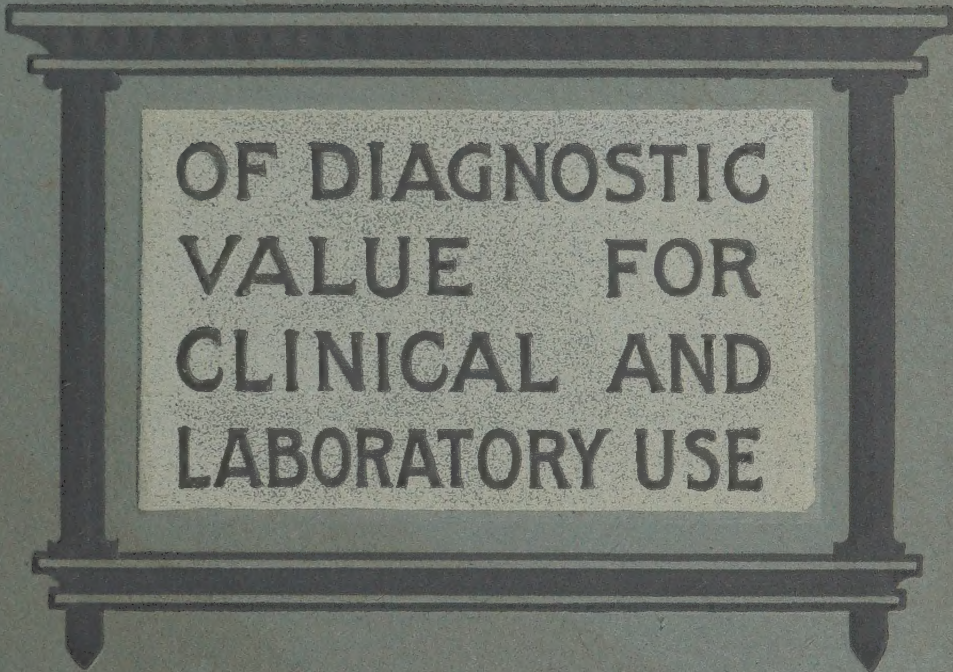


SIGNS_{and} TESTS



OF DIAGNOSTIC
VALUE FOR
CLINICAL AND
LABORATORY USE

PRESENTED BY
THE PALISADE MAN'FG. CO. YONKERS, N.Y.

MAKERS OF *Hemaboleids*
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SIGNS AND TESTS

OF DIAGNOSTIC VALUE FOR CLINICAL AND LABORATORY USE

PART I

PRESENTED BY

THE PALISADE MANUFACTURING CO.

YONKERS, N. Y.

MAKERS OF

HEMABOLOIDS

AND *BOROLYPTOL*

FOREWORD

KNOWLEDGE, however comprehensive and carefully chosen, depends upon an active and retentive memory for its effectiveness and value. The ability to retain and to produce when wanted, varies with the individual. The physician, unlike members of allied professions, is called upon to carry in his mind details and data which in other callings can be left to works of reference and looked up when desired. Not only this, but in many instances, when this can be done by the doctor, it takes time, effort and calls for a more or less extensive library. The rapid advance being made in diagnostic methods, both laboratory and clinical, results in constant modification of technique, the description of new *signs*, the recording of *tests*, etc. Even if the attempt be made to collect and file these, it is difficult and requires more time and attention than the busy physician can devote to it. With this in mind, The Palisade Mfg. Co., Makers of *Hemaboloids* and *Borolyptol*, have endeavored to collect and publish in condensed, compendious and compact form, the various *Signs* and *Tests*, of value to the busy doctor, in the hope that by keeping it at hand for ready reference, he may economize in time and effort and have at his command at any time, information which will prove of practical value to him in the successful practice of his profession.

Special effort has been made to embody in the text, modifications of common *Signs* and *Tests*, which constantly appear in various medical journals. It has been found necessary to issue the booklet, "Signs and Tests," in two parts as the matter is too extensive to be included in one volume. The two parts will be uniform in size and treatment.

THE PALISADE M'F'G CO.

YONKERS, N. Y.

MAKERS OF

HEMABOLOIDS

AND **BOROLYPTOL**

Abdominal Reflex

This superficial reflex, obtained by lightly but quickly stroking a finger-nail or pin across the hypochondrium on each side, may be of great assistance in the differential diagnosis of hysteria and organic brain disease.

Diminution, or loss of the reflex on one side, is very strong evidence of the presence of an organic lesion, and it may be the determining point in the diagnosis when other signs of hemiplegia are slight and indefinite.

Babinski lays even greater stress on the unilateral loss of the cremasteric reflex in similar conditions.

The abdominal reflex is lost on both sides in acute abdominal disease, such as enteric fever, appendicitis, or peritonitis, and this sign may, therefore, be of use in distinguishing enteric from influenza, etc.

Appendicitis—Widmer's Sign

Right axillary temperature is distinctly higher than the left, absence is of no negative significance.

Morris' Point

Tenderness of lumbar ganglia at point $1\frac{1}{2}$ inches from the navel on line drawn from navel to the anterior superior spinous process of ilium.

Significance.

Right lumbar ganglia tender, alone—appendix trouble. Right and left lumbar ganglia tender, together—pelvic trouble. Neither right nor left lumbar ganglia tender—trouble somewhat cephalad from pelvis and appendix.

Head's Zones—Areas of Tenderness

(1) The largest area is in the form of a continuous band corresponding roughly to the distribution of the whole of the sensory fibres of the eleventh right dorsal segment. Beginning at the back close to the middle line, the band slopes slightly downward. As it is followed around to the front, its lower edge just skirts the crest of the ilium and it ends in the hypogastrium. (2) Another area is triangular, bounded below by Poupart's ligament, above by a line

drawn out from the umbilicus and to the inner side by a vertical line just to the right of the middle line. Its apex is at the anterior superior spine of the ilium. (3) The third form is a circular patch just below the center of the line joining the right anterior superior spine of the ilium and the umbilicus.

A patient displaying an area of superficial tenderness of one of these three definite varieties is, in the majority of cases, suffering from appendicitis. The tenderness is apparently of reflex origin and due to tension within the appendix. It usually disappears when suppuration sets in and is most frequently present early in the case. It is found as frequently in subsequent as in first attacks of appendicitis and may persist after all other signs of the disease have disappeared.

Rovsing-Chase Method

"The patient is best placed on a hard, low bed or table. The knees should be flexed and two pillows placed under the head and shoulders, giving a dorsal semi-recumbent position, rendering the abdomen flaccid for the most satisfactory abdominal compression. The surgeon stands on the patient's left, facing the feet. The palmar surfaces of the fingers of the right hand are placed under the patient's left inguinal region and the fingers of the left hand used to reinforce the right. Deep pressure is then made backward, slowly drawing the fingers deeply and forcibly upward under the left costal arch.

This procedure is intended to compress the lower portion of the descending colon and force its gaseous content into the transverse, and thence to the ascending colon. The pressure being maintained with the fingers of the left hand, the right hand is then removed and placed over the upper portion of the descending colon, or better, over the transverse colon, and the fingers are quickly and forcibly depressed. A gaseous compression wave will travel across the transverse and down the ascending colon and on arriving at the cecum will produce cecal distension, yielding a typical sharp pain in the right iliac fossa, if inflammation of the cecum or appendix be present."

S I G N S

Symptoms on the Left Side in Appendicitis

Burckhardt, of Wuerzburg, gives three varieties:

(1) When in chronic cases some extension of the septic process has begun secondary changes extending to the left.

(2) In cases in which it is believed the appendix by abnormal positions points to the median line. Anatomists are familiar with different positions of the appendix, the exact proportion of cases of leftward anterior pointing not being established, the practitioner must watch suspicious cases in which the symptoms upon the right side are slight or absent, either due to diminution of the activity of suppuration or subsidence altogether.

The third class of cases is rare, but must always the more be held in mind, namely that of visceral inversion and leftsided appendix. To the cases of the second class belong those of left hernia into which appendix and cecum have become drawn over.

Indications of Leucocyte count in:

A—Increased proportion of polynuclear neutrophil cells in differential count.

B—Degree of general leucocytosis.

Slight A	{ slight infection.	Falling A	{	convalescence.
Slight B	{ fair resistance.	Falling B	{	
Slight A	{ slight infection.	Falling A	{	lessening toxemia.
Marked B	{ good resistance.	Rising B	{	improving resistance.
Marked A	{ severe infection	Rising A	{	increasing toxemia.
Slight B	{ poor resistance.	Falling B	{	decreasing resistance.

Abadie's Sign

Spasm of the upper eyelids noticed in exophthalmic goiter.

Allis's Sign

Relaxation of fascia between crest of the ilium and great trochanter. Found in fracture of neck of femur.

Auenbrugger's Sign

Bulging of the epigastrium noticed in cases of extensive pericardial effusion.

Ahlfeld's Sign

This term is applied to irregular contractions of localized areas of the uterus, observed after the third month of pregnancy.

Argyll-Robertson Pupil

A sign often seen in locomotor ataxia where the pupil-reflex to light is lost. It is also seen in paretic dementia, syphilis, etc.

Aufrecht's Sign

A condition noticed in stenosis of the trachea consisting in short and feeble respiration, heard above the jugular fossa on placing a stethoscope over the trachea.

Arnoux's Sign

In twin pregnancy when the two fetuses are placed in the right relations to one another a peculiar rhythm is produced by the action together of the two hearts, which reminds the examiner of the sound of the hoofs of a span of horses trotting. First, there is unison of the beats, then the sounds separate and are heard redoubled, until we hear four distinct sounds, then unison comes again. The two hearts are not working in absolute unison. The sign is due to the superposition of two asynchronous hearts. This occurs when one twin is placed to the left, the other to the right—one in the breech and the other in the vertex presentation.

Battle's Sign

When present, is pathognomonic of a fracture of the base of the skull (posterior fossa). Blood accumulates beneath the deep fascia and produces discoloration in the line of the posterior auricular artery, the ecchymosis first appearing near the tip of the mastoid.

Babinski's Sign

Diminution or absence of the Achilles-tendon reflex. Found in true sciatica.

Baccelli's Sign

Reverberation of whisper through chest wall (pleural effusion)

S I G N S

Babinski's Phenomenon or Reflex

Extension of the toes (instead of flexion) on exciting the sole of the foot. Present in organic hemiplegia.

Ballet's Sign

Loss of all voluntary movements of the eye ball, but with preservation of the automatic movements.

Bamberger's Pulse

Pulsation of the jugular vein, synchronous with the cardiac systole, noticed in tricuspid insufficiency.

Bamberger's Sign

Perception of a stimulus applied to one extremity at the corresponding place on the other extremity.

Baillarger's Sign

Inequality of the pupils in paralytic dementia.

Baruch's Sign

The resistance of the rectal temperature in typhoid fever to a bath of 75° F. for fifteen minutes.

Bird's Sign

A zone of dulness with absence of the respiratory sound, in hydatids of the lung.

Boutillau's Tinkling

A peculiar metallic clink sometimes heard in cardiac hypertrophy, to the right of the apex beat.

Borsieri's Sign

The finger nail drawn on the skin, in the early stages of scarlet fever, leaves a white line, which quickly turns red.

Brodie's Pain

In neuralgia of a joint, the pain caused by lifting a fold of skin in the neighborhood of the joint.

Brissaud-Marie's Symptom

Glosso-labial hemispasm occurring in hysteria.

S I G N S

Broadbent's Sign

A sign in adherent pericardium, consisting of a retraction of the eleventh and twelfth ribs on the left side, synchronous with the systole.

Bruit de Leudet

A fine, crackling sound in the ear, observed in catarrhal and nervous affections of that organ. It is audible to both patient and listener.

Bryson's Sign

Diminished extension of the chest in inspiration, noticed in some cases of exophthalmic goiter and neurasthenia.

Burton's Line

The bluish or black line on the gums noticed in chronic lead poisoning.

Bard's

In organic nystagmus oscillations increase as patient's attention follows the finger alternately moved from side to side.

Becker's

Increased pulsation in retinal arteries (exophthalmic goiter).

Bolognini's

Sensation of friction on alternate pressure with fingers of both hands on right and left sides of abdomen (measles).

Bouveret's Sign

Distention of cecum and elevation in the right iliac fossa, noticed in intestinal obstruction.

Brown's "Dipping=crackle" Sign of Intestinal Perforation in Typhoid Fever

Heard on placing the bell of the stethoscope over the right iliac fossa and dipping suddenly with it as in dipping palpation. The very fine crackle heard sounding much like a fine crepitant râle or as if two sticky surfaces are being drawn apart.

S I G N S

Brown's Gravitation Sign

On occurrence of sudden sharp pain in lower part of abdomen, especially the right iliac fossa, accompanied by tenderness with or without rigidity, abdomen should be carefully examined, and area of tenderness marked out. Patient then should be turned on unaffected side and, if in from fifteen to thirty minutes, tenderness has moved one or two inches, or tenderness and rigidity should become marked, an immediate operation is indicated.

Babinski's Platysma Symptoms

Contraction on the healthy side is more energetic than that on the affected side, noticed when patient opens mouth wide, whistles, blows or goes through the movements deglutition (Hemiplegia).

Babinski's Sign

Combined flexion phenomenon. When the patient lies fully extended on his back on a horizontal surface, such as the floor, with his arms crossed upon the chest, and then makes an effort to assume the sitting position; on the paralysed side, the thigh makes a movement of flexion upon the pelvis, and the heel is lifted from the ground, while, upon the opposite side, the limb remains unmoved, or the flexion and raising of the heel only take place much more slowly and to a much less degree than on the paralysed side. At the same time, the shoulder on the sound side is carried forward. The movement is reproduced, and may be more or less accentuated than in the preceding, when the patient, from the sitting position, still with arms crossed before him, allows the trunk to fall back to the first position. These two symptoms, which are easy to ascertain in organic hemiplegia, are, on the other hand, absent in hysterical hemiplegia.

Biot's Respiration

Is characterized by very decided pauses in the breathing which last from several seconds to half a minute or longer. They are more or less periodic but at times repeat themselves irregularly. Especially common in Meningitis.

S I G N S

Biermer's Phenomenon

The pitch of the metallic resonance over a sero—and pyo-pneumothorax is deepened in the erect and raised in the recumbent posture.

Beaume's Sign

Agonizing pain usually referred to the middle or back of the sternum (Angina Pectoris).

Berger's Sign

Irregular or oval pupil met with in Locomotor Ataxia.

Boas's Sign

Almost total or an entire absence of free H Cl and an excess of lactic acid in gastric contents after a test meal (Cancer of the Stomach).

Bordier=Frankel's Sign

Upward and outward rolling of the eye met with in Peripheral Paralysis (Seventh nerve).

Burger's Sign

Absence of light-perception on electric illumination of antrum. (See Garel's Sign.)

Biernacki's Symptom

Analgesia of the ulnar nerve in the region of the elbow; noticed in locomotor ataxia and paretic dementia.

Beatty=Bright's Friction Sound

The sound produced by rubbing together of the surfaces of an inflamed pleura.

Beccaria's Sign

Painful pulsating sensation in the back of the head, complained of by some women during pregnancy.

Behier=Hardy's Symptom

An early symptom in pulmonary gangrene, consisting in the loss of the voice,

S I G N S

Berger's Paresthesia

Paresthesia of the lower extremities in young people, accompanied by weakness, but without objective symptoms.

Bernhard's Paresthesia

Abnormal sensation in the region supplied by the external cutaneous nerve of the thigh.

Bezold's Symptom

Inflammatory swelling below the apex of the mastoid process, occurring in suppuration of the mastoid.

Beaumé's Sign

Pain in the retro-sternal region present in angina pectoris.

Bell's Phenomenon

In peripheral facial paralysis when an attempt is made to close the eye of the affected side the eyeball rolls upward and outward.

Bell's Spasm

Convulsive facial tic.

Bechterew's Sign

Anesthesia of motor ataxia.

Bozzolo's Sign

Pulsation of the arteries of the nares, visible to the eye, in aneurysm of the thoracic aorta.

Braxton-Hick's Sign

Intermittent uterine contractions, produced by pregnancy (from the end of the third month) or by intrauterine tumors.

Crichton-Browne's Sign

Tremor of outer angles of the eyes and labial commissures in early paralytic dementia.

Coin Sign

Coin in front of chest, tapped with another coin, heard at back. (Pneumothorax, Bronchiectasis).

S I G N S

Cardarelli's Sign

A sidewise movement of the trachia, felt on palpation in thoracic aneurism.

Charcot's Symptom

Intermittent claudication, *i. e.*, lameness, muscular pain and weakness of the legs, with numbness, tingling and other disorders of sensation occurring in Arteriosclerosis.

Chvostek's Sign

A contraction of the muscles caused by light tapping along the course of a nerve (Tetany).

Clark's Sign

Splenic and liver dulness obscured or obliterated (Acute Peritonitis).

Colles' Law

A syphilitic infant born of a non-syphilitic mother cannot transmit the disease to her, even though she nurse it while there exist syphilitic lesions upon its lips or within its mouth.

Courvoisier's Law

The gall bladder which contains calculi is not enlarged except in so far as the contained stones increase its size (Cholelithiasis).

Corrigan Pulse

Characteristic pulse of aortic insufficiency.

Corrigan's Line

A purple line at junction with teeth and gums, found in chronic copper poisoning.

Dance's Sign

Depression in the right iliac fossa (Intussusception).

De Mussey's Sign

Intense pain on pressure in the left hypochondrium (Acute Pleurisy).

S I G N S

Demarquay's

Fixation or lowering of the larynx during phonation and deglutition (syphilis of trachea).

Drummond's

A whiff heard at open mouth during respiration (Aortic Aneurism).

Duchennes's

Sinking in of epigastrium in inspiration (Paralysis of Diaphragm).

Early Sign of Measles

Catarrhal conjunctivitis beginning in that part of conjunctiva exposed next to cornea, the so-called pterygeal conjunctivitis.

Early Sign of Pregnancy

Development of fine, downy lanugo hair over entire body and marked hypertrichosis in locations normally covered with hair.

Early Sign of Locomotor Ataxia

Presence of an excess of lymphocytes in the cerebro-spinal fluid.

Epileptic Voice Sign

Monotonous breathy tone. Vowels run along on even tones, the so-called "plateau speech."

Ewart's Sign

Undue prominence of upper border of the first rib (Pericarditis with effusion.)

Ellis's

Peculiar curved line of dulness noted during resorption of pleural exudate.

Echo Sign

Repetition of the last word or clause of a sentence (certain brain diseases).

S I G N S

Erb's

Increased motor irritability to electric stimulation (Tetany).
Dulness in percussion over sternum (Acromegalia).

Fitz's Law

Acute pancreatitis is suspected when a previously healthy person or sufferer from occasional attacks of indigestion is suddenly seized with violent epigastric pain, vomiting and collapse and followed within 24 hours by a circumscribed epigastric swelling, tympanites or resistance with slight rise in temperature.

Fourth Important Symptom of Exophthalmic Goiter

Inability of patient to expand the chest under forced inspiration more than three-quarters to one inch.

Fisher's

Presystolic murmur (in adherent pericardium).

Flush-Tanks

Passage of large amount of urine and consequent temporary disappearance of lumbar swelling (hydronephrosis).

Friedreich's

Diastolic collapse of cervical veins (adherent pericardium).

Frankel's Sign

Diminished tonicity of the hip muscles (Locomotor ataxia.)

Glasgow's Sign

Systolic sound in the brachial artery (Aneurism of the Thoracic Aorta).

Garel's

Absence of light perception on affected side on electric illumination of the antrum (Antrum disease).

Gould's Bowed-Head Sign

Head bowed in walking to see the ground (destruction of peripheral part of retina).

S I G N S

Gerhardt's

Absence of laryngeal movement in dyspnea (aneurism of aorta).

Change of percussion sound with change of position of patient (pneumo thorax-tuberculosis).

Gowers's

Abrupt intermittent oscillation of iris on exposure to light (tabes dorsalis).

Graefe's

Failure of eyeball to move downward with upper lid in looking down (exophthalmic goiter).

Griesinger's

Equality of pitch between inspiratory and expiratory murmur (obstruction to expiration).

Guyon's

Ballotment and palpation of a floating kidney.

Gangolphe's Sign

Sero sanguineous abdominal effusion (strangulated hernia).

Grocco's Sign

A triangular area of dulness bounded by the line of the spinous processes of the vertebrae, by the lower limit of normal pulmonary resonance and by a line rising from this boundary to the median line at or about the upper limit of the dulness due to the fluid. Found upon the unaffected side in Acute Serous Pleurisy.

Gubler's Sign

Swelling of the wrist met with in Blood Poisoning.

Goggia's Sign

Fibrillary contraction in brachial biceps after being lightly struck and then pinched, extends throughout the whole muscle in health. In debilitating disease, especially in typhoid fever, contraction is local and does not extend.

TESTS

Ammonia in the Urine

Twenty-five cc. of urine are measured with a pipette into a conical flask of about 250 cc. capacity, and diluted with about 50 cc. of distilled water. Four drops of a 1% alcoholic solution of phenolphthalein are added, and decinormal Sodium hydrate is run in from a burette, until a definite pink color that does not disappear on shaking is attained. The number of cubic centimeters of decinormal sodium hydrate added gives the acidity of the urine. About 5 cc. of commercial formalin that have been neutralized beforehand by adding an equal volume of water, a drop of phenolphthalein solution, and sufficient decinormal sodium hydrate solution to produce a pink tinge, are now added to the urine. The pink color at once disappears, since the acids previously combined with the ammonia in the urine have been liberated. More decinormal caustic soda solution is added until the pink color disappears. This amount of Sodium hydrate is chemically equivalent to the ammonia previously present as ammonium salts, now in combination as urotropin. The amount of nitrogen present as ammonia in the twenty-four hours' urine can readily be estimated, since 1 cc. of decinormal soda is equal to 0.0017 gram of ammonia—that is, to 0.0014 gram of nitrogen.

Normally about 3%; in disease as much as 50%, of the nitrogen excreted in the urine is in the form of ammonia.

Ammonia in Saliva

Place one large drop of saliva on a porcelain tablet. In the center of the drop place a tiny drop of Nessler's reagent, when, if ammonia is present, a reddish yellow color and precipitate will result, while around throughout the saliva will be noticed a faint pinkish color or aura encircling the reagent. The color will depend upon the amount of ammonia present and will be shaded accordingly.

Ammonia Estimation in Diabetes, Clinical Value of

Hewes and Adler deduct the following conclusions: 1. Quantities of ammonia reaching 5 gm. in 24 hours indicate an extremely severe form of diabetes, which usually proves fatal within a year.

TESTS

2. Patients under 40 years of age tolerate an acidosis estimated in terms of 4 to 5 gm. ammonia far better than those above 50 years tolerate an acidosis of 2.5 to 4 gm. ammonia. An acidosis in an individual above 50 years of age is of very serious prognostic import. 3. A knowledge of ammonia excretion usually helps in the treatment of a case of diabetes, and generally, but not always, gives warning of impending danger. 4. The value of a knowledge of the ammonia excretion in the prognosis of a diabetic patient is enhanced by a knowledge of the quantity of albumin and carbohydrate in the diet. 5. A lowering of the carbohydrate intake in a severe case of diabetes from a total of 80 gm. to 55 gm. in 24 hours produces little effect upon the acidosis.

Albumin in Urine, Quantitative Estimation of

The following solution is used in this test. This acid solution has been found to precipitate exactly 0.0001 gram albumin:

Phosphotungstic acid.....	1.5 gm.
Hydrochloric acid (conc).....	5 cc.
Alcohol, 95 per cent. q. s. ad.....	100 cc.

First the Heller test is made, and if much albumin is present the urine is diluted 1 in 10; if not, undiluted filtered urine is used. Five cc. of the phosphotungstic acid solution are put in a test-tube, and then with a 2 cc. pipette (graduated in tenths of a cubic centimeter), the filtered urine is added to this, shaken after the addition of each tenth, and urine added until a whitish cloud appears. The number of tenths of a cubic centimeter is read off and expressed in terms of 100 cc. For example, if it takes 1 cc. of diluted urine (1 in 10) there is 0.0001 gm. albumin in 0.1 cc. of undiluted urine, or in 100 cc. there is 0.1 gm. albumin, or 1 gm. in 1000 cc. On the other hand, if 0.7 cc. diluted urine (1 in 10) is used, then 0.07 cc. undiluted urine equals 0.0001 gm. albumin, 7 cc. diluted urine equals 0.01 gm. albumin, and 700 cc. equals 1 gm. albumin. The following equation gives the percentages:

700: 1.0 :: 100: X or 0.142 per cent. or 1.42 gm. per thousand.

TESTS

Albumin Test (serum albumin)

The most reliable test for serum albumin in urine is that of "salting" the urine with a saturated solution of "salt" (sodium chlorid), acidulating with 50 per cent. acetic acid, and heating to boiling; this throws down all traces of serum-albumin and prevents a nucleo-albumin reaction.

Albuminuria, A Chemical Test for Functional

In functional albuminuria, Sir A. E. Wright noted a lessened coagulability of the blood, causing diminished viscosity. Calcium salts reduce the coagulation-time and increase the viscosity of the blood. He found that calcium salts would control functional albuminuria, whereas, through their operation organic albuminuria would not be diminished and might be increased. The subjects of functional albuminuria have often been growing rapidly, so that there is an extra demand for calcium on the part of the tissues. He, therefore, considered this condition hematogenous in origin and allied to a serous exudate, such as occurs in urticaria. Fifteen grains of calcium lactate, given three times a day in water, should control the albumin in such cases. Dr. Langdon Brown observed that the administration of calcium lactate controlled the albumin in four cases of functional albuminuria, whereas in organic albuminuria there was no effect.

The best method of giving it is in solution, as follows:

R	Precipitated Calcium carbonate.....	3j
	Lactic acid.....	gr. cxxx
	Water enough to make.....	3vi

Solve.—

One tablespoonful contains fifteen grains of calcium lactate.

Acetone in the Urine, Determination of

SALICYLIC ALDEHYDE TEST

To 10cc. of filtered urine add a piece of Sodium hydrate about the size of a pea, 10 drops of a 10 per cent. Alcoholic Solution of Salicylic aldehyde, shake, and warm the *upper* portion of the mixture. A red color (more or less intense, according to the quantity present) appears in the presence of acetone around the lump of Na O H.

TESTS

Bile in Gastric Contents

In testing the gastric contents for bile, allow the gastric juice to pass through white filter-paper, and when it has become dry apply the nitrosonitric acid (nitric acid exposed to the sunlight for several days) test to this filter-paper, instead of testing the filtered gastric contents; otherwise bile in the stomach may escape detection. This reaction is best observed in a somewhat shaded portion of the room.

Bile Pigment Test

Popper and Obermayer have recently taken up the subject of tests for bile pigments. They recommend the employment of a test solution consisting of water, 525 cc. alcohol (95 per cent.), 125 cc. sodium chloride, 1,100 grammes; and 10 per cent. solution of tincture of iodine, 3.5 cc. Five cubic centimetres of this test solution are put into a test tube and the urine to be examined is carefully poured on to the surface. If bile is present a blue green ring forms at the zone of contact; if the urine contains merely a trace of bile the ring is faintly blue in color. The test solution thus made does not keep its strength for any length of time and should not be kept longer than six weeks.

Blood Test

Max Einhorn describes a new test for blood in the stomach contents, feces, and urine. It consists of testing with paper sensitized by the use of benzidin. The paper is immersed in the solution to be examined, and a few drops of peroxid of hydrogen are added, when a blue color is formed if blood is present. The blue or green color appears in a few seconds, and we should not wait more than a minute for the reaction to appear, as after that the color may appear from the presence of other substances than blood. HCl may cause the reaction after two or three minutes. The benzidin test can be recommended as a preliminary test only: a strong reaction or no reaction at all gives a reliable test.

Tests for invisible hemorrhage in diseases of the digestive organs are very valuable and will be much used in diagnosis and prognosis, and as a measure of the results of treatment.

TESTS

Benzidin Test

The material for examination consists of a pea-sized piece of feces thoroughly stirred in a test-tube with a glass rod into about 4 cc. of water. The tube is lightly stoppered and the contents brought to the boiling point to destroy the oxidizing ferments.

Ten drops of a fresh solution of benzidin (prepared by shaking a knife tip of benzidin in about 2 cc. of glacial acetic acid) is added to 3 cc. of a 3% (ordinary commercial) solution of hydrogen peroxid in a test tube. This mixture serves as a control on the cleanliness of reagents and glassware.

To make the test add 2 or 3 drops of the boiled feces mixture to the peroxid benzidin mixture. A clear green or blue color appears within a minute or two when blood is present. This method is quick and very simple. It can be performed within two minutes. It is decidedly more delicate than the Weber guaiac test. The color changes are clearer, sharper and less confusing than in the latter. This is especially true of feces, because very little fecal pigment is present to interfere. The ether extraction of the guaiac test is replaced by the simple, quick method of boiling. Benzidin is oxidized by blood even after the latter is boiled; guaiac is not. The sources of error when used with gastric contents and feces are similar to, but less numerous than, those in the guaiac test, viz., oxidizing ferments in foods and body fluids and certain drugs, particularly salts of iron and other metallic salts.

Bremer's Test for Diabetic Blood

Make a thick smear of blood from the suspected case on a glass slide. Make a similar smear of normal blood as a control. Heat both slides to 130° C. Allow the slides to cool slowly. Stain both blood smears for two minutes with a freshly prepared 1% aqueous solution of congo red. Wash the smears with water. The normal blood is stained red. The diabetic blood takes no stain or assumes a yellow tint. The same reaction to Bremer's test may be present occasionally in leukemia, Grave's disease, and very occasionally in normal blood.

TESTS

Chromocystoscopy

Consists in the artificial coloration of the urine with indigo-carmin and the observation of its appearance in the urine by cystoscopic examination. This method has a three-fold purpose upon which its originator lays great stress.

It has proven itself the most reliable of the color tests, as the indigo-carmin does not undergo any change in the organism. For this method a solution of carminum coeruleum 0.4, sodium chloride 0.6 in aq. dist. 100.0, is used. Twenty cc., representing 80 mg. indigo-carmin, are injected deeply into the quadriceps muscles. In from five to ten minutes the urine entering the bladder will begin to show distinct blue coloration in the normal.

It is necessary that the patient be examined in the early hours of the day after a dry breakfast, or at any rate after some restriction as to the amount of ingested fluids. This will allow the stream of urine issuing from the ureters to be distinctly seen as a deep blue jet, issuing like a cloud of smoke from the crater of a volcano. Normally three ureteral contractions occur in one minute, their occurrence is rhythmic, and they alternate with a certain regularity. The cystoscope is introduced a few minutes after the injection has been made and with a high position of the prism of the instrument it is frequently possible to observe both ureteral openings at the same time. Thus a careful and a comparative study of the type, frequency, and duration of the ureteral contractions and the elimination of the urine can be noted, and an index of the kidney function arrived at.

Carnot's Test (Atonic Dilatation of Stomach)

The patient's stomach is emptied by means of the stomach tube and 500 c.c. of water introduced. The patient remains in an erect posture for an hour, after which the water is withdrawn as completely as possible and measured. Thereupon (or at the next visit) 500 cc. of water are again introduced and the patient is made to lie on his right side for an hour. In this position the force of gravity enables the dilated and weakened stomach to empty itself through the patent pylorus, and at the expiration of the hour the stomach will be found empty or nearly so.

TESTS

Chlorids in the Urine

The quantitative test for chlorids requires either a centrifuge or a burette, but a simple test, and one sufficiently accurate for ordinary purposes, is to take half a test tube of urine, add one drop of nitric acid, then add drop by drop a 5 per cent. solution of silver nitrate. If the chlorids are normal they will be precipitated, falling to the bottom of the glass in the form of a white ball. If the chlorids are decreased, instead of falling as a ball, the drop of silver nitrate will only cause a cloudiness. If the urine contains more than a trace of albumin, the albumin must be removed by heat, as it will cause a cloudiness and the chlorids cannot be distinguished. In cases of pneumonia the chlorids are nearly absent; the return of the chlorids will occur twenty-four hours before the crisis. In chronic disease, it is shown that if the output drops as low as two grams, not depending upon a diminution of the amount ingested, it is a grave sign. The sudden return to normal of the ingestion-excretion ratio has been termed by Achard and Sanbry "chlorine crisis."

Color Reaction in Syphilis

Schürmann in a preliminary communication describes a color reaction which he has obtained with the blood sera of luetic patients. To 0.1 cc. of serum he adds enough physiological saline solution to bring the quantity to 3 or 4 cc., adds to this one drop of perhydrol, which serves as an oxidizer, and then mixes this fluid with 0.5 cc. of the reagent. The latter contains 0.5 of phenol, 0.62 of 5 per cent. aqueous ferric chlorid solution and 34.5 cc. of distilled water and is best prepared fresh for each examination. Normal blood serum shows a slight green ring at the junction of the two fluids, which disappears almost entirely on shaking. The mixture, too, remains clear and transparent. Syphilitic sera, on the other hand, show a dark brown color at the junction of the fluids, and on shaking the mixture appears very thick. The reaction occurs in from one to two minutes; any change in color or transparency occurring later is of no significance. Schürmann has corroborated the specificity of his test by performing parallel reactions according to Wassermann's method.

TESTS

Cambridge's Test for Pancreatic Disease

A sample of the 24 hour urine is tested for albumin, sugar, bile and other abnormal constituents and if found free from them, is carefully filtered.

To 40 cc. of the clear urine 2 cc. strong hydrochloric acid are added and the whole boiled for ten minutes in a long necked flask surmounted by a funnel. Cool, and add water to bring the more or less concentrated fluid back to 40 cc. Add slowly 8 grams lead carbonate and neutralize if necessary. Filter until clear through a moist filter paper. Shake the filtrate with 8 grams of basic lead acetate and again filter until clear. Remove the lead by shaking the filtrate with 4 grams of powdered sodium sulphate, boil, cool, and filter. To 10 cc. of the clear filtrate add 7 cc. distilled water, 2 grams sodium acetate, 0.8 gram phenylhydrazin hydrochlorate, and 1 cc. 50 per cent. acetic acid. Pour into a small flask with funnel condenser, boil on the sand bath for ten minutes, filter hot through a moist filter and if necessary add to the filtrate enough water to make 15 cc. When the test is positive a precipitate forms on standing a few hours; in doubtful cases it must be allowed to stand over night. The precipitate is flocculent, bright yellow in color and microscopically consists of long, yellow, hairlike, flexible needles, readily soluble in 33 per cent. sulphuric acid. It thus clearly resembles a modified phenylhydrazin test for sugar. In order to exclude the latter as a possible source of error, the test should be done with a second sample of the same urine, omitting, however, the first step of boiling with hydrochloric acid. If sugar is present the yellow crystals will form even so. Cambridge declares his test positive only if the crystals are obtained in the manner first described but fail to form when boiling without hydrochloric acid. Pancreatitis regularly gives a positive reaction; pancreatic cancer in about one-fourth of the cases examined. Other conditions that may be confused diagnostically with pancreatitis fail to give the reaction. It will be seen that while the test is a little laborious, all the manipulations are very simple and require no apparatus but flasks, test-tubes and funnels.

TESTS

Desmoid Reaction

Raw catgut is used as an agent to determine the digestibility of the stomach. In this test two India rubber bags containing respectively one decigram of potassium iodid and five centigrams of methylene blue are employed. The bags are tightly tied with catgut and they are taken either together or a short time apart, in order to control both the saliva and the urine.

After emptying the bladder, the patient is instructed to swallow, for example, the bag containing the methylene blue after a full meal, and to keep close watch on his urine. With normal digestion the test is positive in all cases in which the stomach tube proves that the patient has free hydrochloric acid, depending for the intensity of the reaction upon the amount thereof. In normal cases the urine becomes green to blue four to six hours after the ingestion of the pill.

Where there is less hydrochloric acid or only a trace thereof, the urine shows a much lighter green. In the absence of hydrochloric acid, as in gastric carcinoma, pernicious anemia, or general debility of whatever kind, the rubber bag passes unchanged through the intestinal tract, the color of the urine is unchanged, and the tested saliva fails to give the characteristic reaction of iodine. In cases of motor insufficiency, even when there is a normal or excessive amount of acid present, the appearance of the blue in the urine is greatly delayed, showing that this simple test is also an index at times of the motility of the stomach. Therefore, it is claimed that the desmoid reaction is a measure of activity of the gastric digestion of connective tissue (the most difficult material to digest), demonstrates the completeness of digestion of a normal meal, and in addition serves as an index for outlining a proper diet.

Digestive Apparatus, A New Method of Testing the Functions of the

Patients are given in a gelatin capsule a string of beads with the following substances attached thereto: Catgut, fishbone, meat, thymus, potato, mutton fat. After administering the capsule, every stool is examined with the stool sieve until the bead string has been recovered. If diarrhea is present

TESTS

the sifting may not be necessary, as the bead string can readily be seen (usually at the bottom of a glass vessel).

Under normal conditions the bead string appears after one or two days. It is then rinsed in cold water and examined. If digestion is normal, we find that catgut, meat and potato (except the skin) disappear entirely, thymus and fat almost entirely, whereas the fishbone usually disappears, but, occasionally, it may be present. The nuclei of the thymus always disappear. In pathological conditions deviations from the normal are observed, not only in regard to the time of recovery of the beads (disturbances of motility), but also in regard to the presence of the food substances (disturbances of the digestive function).

Digestive Tract, Test for Ulcers of Upper

The method consists in the following: The patient swallows the duodenal bucket in a gelatin capsule about 9 p. m. The thread, which is of braided silk (English, No. 5) is attached to the shirt in such a manner that it can pass into the digestive tract for a distance of 75 cm. from the lips. The bucket is left in the digestive apparatus over night and is removed about 7 or 8 a. m., in the fasting condition. At the pylorus we often experience a slight resistance which is usually easily overcome; a greater resistance is offered at the larynx at the entrance of the esophagus. Here the patient must swallow and while the larynx moves upward the bucket may easily be drawn out. The thread is then closely inspected. In favorable cases of ulcer, particularly if the thread has come into intimate contact with the surface of the ulcer, we find a brown or dirty black discoloration of the thread at this point. The distance of this brown spot from the lips points to the seat of the ulcer. A blood stain in the neighborhood of 40 cm. points to an ulcer at the cardia, at 44 to 54 cm., ulcer of the lesser curvature, 56 to 58 cm., pylorus, 59 and more, ulcer in the duodenum. The method might be called the "thread impregnation test." Ulcers situated in the esophagus, cardia, lesser curvature, pylorus, and duodenum can best be recognized by this method, whereas ulcers of the greater curvature and fundus cannot be discovered by this test.

TESTS

Enzyme Reaction as Test for Milk Supply

Barthel reports a number of tests which showed, among other things, that milk kept on ice for several days, while its acidity did not increase, yet showed a constant multiplication of bacteria from about 10,000 or 220,000 to 49,000,000 or more per cc. He advocates the methylene blue test (5 cc. of a saturated alcoholic solution of methylene blue plus 190 cc. of water—no formalin). He adds 0.5 cc. of this solution to 10 cc. of milk, pouring a few cc. of liquid paraffin on top to keep out the air. The test tube is then placed on the water bath at a temperature of 40° or 45° C. (104° or 113° F.). If the fluid loses its color in a few minutes, there are certainly more than 100,000,000 bacteria to the cc. Pure milk takes more than three hours to destroy the tint.

Free Hydrochloric Acid in the Gastric Juice

A modification of Günzburg's reaction for the detection of free hydrochloric acid in the gastric juice which is believed to be more delicate than the original method is as follows:

The reagent employed is composed of phloridzin, 2 grams; vanillin, 1 gram dissolved in absolute alcohol, 30 cc. A drop of this reagent is placed in a small porcelain capsule, and the capsule placed on a boiling water bath; when the alcohol has evaporated, there remains a feebly yellow colored ring on the capsule. One or two drops of the liquid to be tested are placed, by means of a glass rod, in the center of this ring, in such a way that the liquid is in contact with the internal edge of the ring. If the liquid contains free hydrochloric acid, there is formed on the internal edge of the ring a bright red band which is reduced to a simple line when hydrochloric acid is present in very minute quantity. The use of a water bath is essential for the success of the reaction.

This reagent, like that of Günzburg, does not keep for any length of time. On replacing ethyl alcohol by methyl alcohol, the reaction is more delicate, but the solution of phloridzin and vanillin in absolute alcohol alters very rapidly, so that it is necessary to prepare the reagent extemporaneously for each test.

TESTS

Fat in Feces, Estimation of—I. Walker Hall, of Bristol

1. Before and after administering a known quantity of fat, prescribe fluid extract of hematoxylin. 2. Transfer entire stools to a mortar, add normal KOH solution, stir till all lumps are dissolved, add distilled water to make up 500 cc., and shake. 3. Heat 50 cc. for 20 minutes. 4. To this add 50 cc. of 95 per cent. alcohol; heat for 20 minutes. 5. Add strong HCl until strongly acid. 6. Heat 20 minutes, filter, evaporate to 50 cc. 7. Take 5 cc. and determine fat percentage in a "milk" centrifugal tube, and multiply result by 5, or take 20 cc. in a Schmidt-Werner tube and estimate; after calculation from the dried residue of the aliquot portion of the ethereal extract, multiply result by 25. If the process be interrupted at (3), then the amount of fat extracted approximates that of the fatty acids; this result deducted from the total amount equals that of the neutral fats present.

The Iodin Blood Reaction in Suppurative Conditions—Dunham

An iodine reaction is shown by the blood in suppurative cases. Cover-glass smears are made in the usual way and allowed to dry. The staining fluid consists of iodine, 1 part; potassium iodide, 3 parts; water, 100 parts; gum arabic enough to produce a syrupy consistence; 2 or 3 drops are placed on a slide, the cover floated in it, and after a few moments the excess withdrawn by a bit of filter paper. The specimen is then examined by an immersion lens. The erythrocytes have a dark red color; normal leucocytes are much lighter. In the blood of progressive suppurative cases the protoplasm of a certain proportion of the polymorphonuclear neutrophils takes on a reddish-brown coloration. Some of the leucocytes take on a diffuse stain, some a granular network, while in others the pigmentation is confined to large or small refractive granules, varying in tint from a light pink to a dark red. The intensity of the reaction is said to be closely related to the acuteness of the pus process, being most intense in rapidly progressive strepto and staphylococcus phlegmons. The reaction is absent in tubercular abscesses and in acute abscesses which are well walled off. The reaction is also present in pneumonia and very grave blood diseases.

TESTS

Formaldehyd in Milk, Schiff's Test

Aqueous solution of magenta (fuchsin 0.5 per cent.) . . .	40 c.c.
Distilled water	250 c.c.
Aqueous solution sodium bisulphite (sp. gr. 1.375)	10 c.c.
Pure concentrated sulphuric acid	10 c.c.
Mix and allow to stand until colorless.	

Two cc. of this solution are added to a test tube two-thirds full of suspected milk and the tube shaken. If formaldehyd be present a pink or lilac color will appear in from 30 to 60 seconds.

It is, of course, desirable that the presence of formaldehyd in milk be demonstrated by two or more tests. Beyond the tests above given, among the confirmatory tests, the phenylhydrazin hydrochlorid and ferricyanid method is recommended.

This method may be applied directly to liquid foods or to an aqueous or alcoholic extract of solid foods. To from 3 to 5 cc. of liquid food or extract of the same add a lump of phenylhydrazin hydrochlorid about the size of a pea, from 2 to 4 drops (not more) of a 5 to 10 per cent. solution of potassium ferricyanid, and from 8 to 12 drops of an approximately 12 per cent. solution of sodium hydroxid. The method is not applicable to preparations containing blood-coloring matter. In such cases use nitroprussid in place of the ferricyanid. Alcoholic extracts from foods must be diluted with water to prevent the precipitation of potassium ferricyanid.

Apply the method directly to milk without any preparation of sample. In the case of meat finely comminute the sample, extract with two volumes of hot water, and employ the liquid pressed out for the test. Warm fats above the melting point with 10 cc. of alcohol (80 to 95 per cent. by volume), thoroughly shake, cool, and filter through a moistened paper, using the filtrate for the examination.

When formaldehyd is present to the extent of more than 1 part in 70,000 to 80,000 in the solution tested, a distinct green or bluish green reaction is obtained. In more dilute solutions the green tint becomes less marked and a yellow tinge tending toward greenish brown is formed.

TESTS

Gastric Acidity, A Simplified Method of Determining

The only apparatus required is a tall, narrow cylindrical glass graduate, graduated to tenths of a cc., and a finely drawn pipette. The tenth normal sodium hydroxid solution is kept in a rubber stoppered bottle. The color reagents used are 1 per cent. alcoholic sol. phenolphthalein, 0.5 per cent. alcoholic sol. dimethylamidoazobenzol, 1 per cent. sol. aqueous alizarin monosulphate. Acidity is expressed in terms of the number of cc. of filtrate required to neutralize 100 cc. of tenth normal sodium hydroxid solution. 5 cc. of filtrate are placed in the graduate and a drop of phenolphthalein solution added, also a drop of dimethylamidoazobenzol solution added. Sodium hydroxid solution is then added drop by drop from the pipette and the amount read when the color reaction occurs.

Lemon yellow indicates the absence of free acid. In the presence of free alkali phenolphthalein gives a red color. In the same way to 5 cc. of filtrate a drop of alizarin sol. is added and sodium hydroxid solution drop by drop. A purple color results when free and loosely combined acid has been neutralized. The number of cc. of sodium hydroxid solution used is figured by deduction, allowing approximately one-tenth cc. in each case for the indicator used. The acidity represents free acid, loosely combined acids and acid salts.

General Paralysis and Tabes, Chemical Test in

The Noguchi reaction consists in the addition of 0.5 cc. of a solution of ten per cent. butyric acid in normal sodium chlorid solution to 0.1 cc. of the fluid to be examined; the application of heat; subsequent addition of 0.1 cc. of 4 per cent. sodium hydrate solution, with a further application of heat. The test tube should be examined within three hours. A distinct opalescence is frequently found to occur, even in the normal, but in cases of general paralysis and tabes a characteristic precipitate of a peculiar flocculent character forms. The flocculi tend gradually to fall, so that after 24 hours at the latest the bottom of the tube is occupied with a fairly bulky precipitate, while the supernatant fluid is clear.

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